

SEQUENCE LISTING

<110> Apicella, M. A.
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 Gibson, B. W.
 Scheffler, K.
 Brown, E.

<120> Vaccine and compositions for the
 prevention and treatment of Neisserial infections

<130> 875.045US1

<150> US 60/344,452

<151> 2001-10-23

<150> US 60/310,356

<151> 2001-08-06

<150> US 60/266,070

<151> 2001-01-31

<160> 12

<210> 1

<211> 2015

<212> PRT

<213> Neisseria gonorrhoeae

<400> 1

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| Met | Asn | Lys | Gly | Leu | His | Arg | Ile | Ile | Phe | Ser | Lys | Lys | His | Ser | Thr |
| 1 | | | | 5 | | | | | 10 | | | | | 15 | |
| Met | Val | Ala | Val | Ala | Glu | Thr | Ala | Asn | Ser | Gln | Gly | Lys | Gly | Lys | Gln |
| | | | 20 | | | | | 25 | | | | | 30 | | |
| Ala | Gly | Ser | Ser | Val | Ser | Val | Ser | Leu | Lys | Thr | Ser | Gly | Asp | Leu | Cys |
| | | 35 | | | | | 40 | | | | | 45 | | | |
| Gly | Lys | Leu | Lys | Thr | Thr | Leu | Lys | Thr | Leu | Val | Cys | Ser | Leu | Val | Ser |
| | 50 | | | | | 55 | | | | | 60 | | | | |
| Leu | Ser | Met | Val | Leu | Pro | Ala | His | Ala | Gln | Ile | Thr | Thr | Asp | Lys | Ser |
| 65 | | | | 70 | | | | | 75 | | | | | 80 | |
| Ala | Pro | Lys | Asn | Gln | Gln | Val | Val | Ile | Leu | Lys | Thr | Asn | Thr | Gly | Ala |
| | | | 85 | | | | | 90 | | | | | 95 | | |
| Pro | Leu | Val | Asn | Ile | Gln | Thr | Pro | Asn | Gly | Arg | Gly | Leu | Ser | His | Asn |
| | | 100 | | | | | | 105 | | | | | 110 | | |
| Arg | Tyr | Thr | Gln | Phe | Asp | Val | Asp | Asn | Lys | Gly | Ala | Val | Leu | Asn | Asn |
| | 115 | | | | | | 120 | | | | | 125 | | | |
| Asp | Arg | Asn | Asn | Asn | Pro | Phe | Leu | Val | Lys | Gly | Ser | Ala | Gln | Leu | Ile |
| | 130 | | | | | 135 | | | | | 140 | | | | |
| Leu | Asn | Glu | Val | Arg | Gly | Thr | Ala | Ser | Lys | Leu | Asn | Gly | Ile | Val | Thr |
| 145 | | | | 150 | | | | | | 155 | | | | 160 | |
| Val | Gly | Gly | Gln | Lys | Ala | Asp | Val | Ile | Ile | Ala | Asn | Pro | Asn | Gly | Ile |
| | | | 165 | | | | | 170 | | | | | 175 | | |
| Thr | Val | Asn | Gly | Gly | Gly | Phe | Lys | Asn | Val | Gly | Arg | Gly | Ile | Leu | Thr |
| | | 180 | | | | | | 185 | | | | | 190 | | |
| Ile | Gly | Ala | Pro | Gln | Ile | Gly | Lys | Asp | Gly | Ala | Leu | Thr | Gly | Phe | Asp |
| | 195 | | | | | | 200 | | | | | 205 | | | |
| Val | Arg | Gln | Gly | Thr | Leu | Thr | Val | Gly | Ala | Ala | Gly | Trp | Asn | Asp | Lys |
| | 210 | | | | | 215 | | | | | 220 | | | | |

| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Gly | Gly | Ala | Asp | Tyr | Thr | Gly | Val | Leu | Ala | Arg | Ala | Val | Ala | Leu | Gln | 225 | 230 | 235 | 240 |
| Gly | Lys | Leu | Gln | Gly | Lys | Asn | Leu | Ala | Val | Ser | Thr | Gly | Pro | Gln | Lys | 245 | 250 | 255 | |
| Val | Asp | Tyr | Ala | Ser | Gly | Glu | Ile | Ser | Ala | Gly | Thr | Ala | Ala | Gly | Thr | 260 | 265 | 270 | |
| Lys | Pro | Thr | Ile | Ala | Leu | Asp | Thr | Ala | Ala | Leu | Gly | Gly | Met | Tyr | Ala | 275 | 280 | 285 | |
| Asp | Ser | Ile | Thr | Leu | Ile | Ala | Asn | Glu | Lys | Gly | Val | Gly | Val | Lys | Asn | 290 | 295 | 300 | |
| Ala | Gly | Thr | Leu | Glu | Ala | Ala | Lys | Gln | Leu | Ile | Val | Thr | Ser | Ser | Gly | 305 | 310 | 315 | 320 |
| Arg | Ile | Glu | Asn | Ser | Gly | Arg | Ile | Ala | Thr | Thr | Ala | Asp | Gly | Thr | Glu | 325 | 330 | 335 | |
| Ala | Ser | Pro | Thr | Tyr | Leu | Ser | Ile | Glu | Thr | Thr | Glu | Lys | Gly | Ala | Ala | 340 | 345 | 350 | |
| Gly | Thr | Phe | Ile | Ser | Asn | Gly | Gly | Arg | Ile | Glu | Ser | Lys | Gly | Leu | Leu | 355 | 360 | 365 | |
| Val | Ile | Glu | Thr | Gly | Glu | Asp | Ile | Ser | Leu | Arg | Asn | Gly | Ala | Val | Val | 370 | 375 | 380 | |
| Gln | Asn | Asn | Gly | Ser | Arg | Pro | Ala | Thr | Thr | Val | Leu | Asn | Ala | Gly | His | 385 | 390 | 395 | 400 |
| Asn | Leu | Val | Ile | Glu | Ser | Lys | Thr | Asn | Val | Asn | Asn | Ala | Lys | Gly | Ser | 405 | 410 | 415 | |
| Ala | Asn | Leu | Ser | Ala | Gly | Gly | Arg | Thr | Thr | Ile | Asn | Asp | Ala | Thr | Ile | 420 | 425 | 430 | |
| Gln | Ala | Gly | Ser | Ser | Val | Tyr | Ser | Ser | Thr | Lys | Gly | Asp | Thr | Glu | Leu | 435 | 440 | 445 | |
| Gly | Glu | Asn | Thr | Arg | Ile | Ile | Ala | Glu | Asn | Val | Thr | Val | Leu | Ser | Asn | 450 | 455 | 460 | |
| Gly | Ser | Ile | Gly | Ser | Ala | Ala | Val | Ile | Glu | Ala | Lys | Asp | Thr | Ala | His | 465 | 470 | 475 | 480 |
| Ile | Glu | Ser | Gly | Lys | Pro | Leu | Ser | Leu | Glu | Thr | Ser | Thr | Val | Ala | Ser | 485 | 490 | 495 | |
| Asn | Ile | Arg | Leu | Asn | Asn | Gly | Asn | Ile | Lys | Gly | Gly | Lys | Gln | Leu | Ala | 500 | 505 | 510 | |
| Leu | Leu | Ala | Asp | Asp | Asn | Ile | Thr | Ala | Lys | Thr | Thr | Asn | Leu | Asn | Thr | 515 | 520 | 525 | |
| Pro | Gly | Asn | Leu | Tyr | Val | His | Thr | Gly | Lys | Asp | Leu | Asn | Leu | Asn | Val | 530 | 535 | 540 | |
| Asp | Lys | Asp | Leu | Ser | Ala | Ala | Ser | Ile | His | Leu | Lys | Ser | Asp | Asn | Ala | 545 | 550 | 555 | 560 |
| Ala | His | Ile | Thr | Gly | Thr | Ser | Lys | Thr | Leu | Thr | Ala | Ser | Lys | Asp | Met | 565 | 570 | 575 | |
| Gly | Val | Glu | Ala | Gly | Leu | Leu | Asn | Val | Thr | Asn | Thr | Asn | Leu | Arg | Thr | 580 | 585 | 590 | |
| Asn | Ser | Gly | Asn | Leu | His | Ile | Gln | Ala | Ala | Lys | Gly | Asn | Ile | Gln | Leu | 595 | 600 | 605 | |
| Arg | Asn | Thr | Lys | Leu | Asn | Ala | Ala | Lys | Ala | Leu | Glu | Thr | Thr | Ala | Leu | 610 | 615 | 620 | |
| Gln | Gly | Asn | Ile | Val | Ser | Asp | Gly | Leu | His | Ala | Val | Ser | Ala | Asp | Gly | 625 | 630 | 635 | 640 |
| His | Val | Ser | Leu | Leu | Ala | Asn | Gly | Asn | Ala | Asp | Phe | Thr | Gly | His | Asn | 645 | 650 | 655 | |
| Thr | Leu | Thr | Ala | Lys | Ala | Asp | Val | Asn | Ala | Gly | Ser | Val | Gly | Lys | Gly | 660 | 665 | 670 | |
| Arg | Leu | Lys | Ala | Asp | Asn | Thr | Asn | Ile | Thr | Ser | Ser | Ser | Gly | Asp | Ile | 675 | 680 | 685 | |

| | | | | | | | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|--|--|
| Thr | Leu | Val | Ala | Gly | Asn | Gly | Ile | Gln | Leu | Gly | Asp | Gly | Lys | Gln | Arg | | |
| 690 | | | | | | 695 | | | | | 700 | | | | | | |
| Asn | Ser | Ile | Asn | Gly | Lys | His | Ile | Ser | Ile | Lys | Asn | Asn | Gly | Gly | Asn | | |
| 705 | | | | | 710 | | | | | 715 | | | | | 720 | | |
| Ala | Asp | Leu | Lys | Asn | Leu | Asn | Val | His | Ala | Lys | Ser | Gly | Ala | Leu | Asn | | |
| | | | | 725 | | | | | 730 | | | | | 735 | | | |
| Ile | His | Ser | Asp | Arg | Ala | Leu | Ser | Ile | Glu | Asn | Thr | Lys | Leu | Glu | Ser | | |
| | | | 740 | | | | | 745 | | | | | 750 | | | | |
| Thr | His | Asn | Thr | His | Leu | Asn | Ala | Gln | His | Glu | Arg | Val | Thr | Leu | Asn | | |
| | | 755 | | | | 760 | | | | | | 765 | | | | | |
| Gln | Val | Asp | Ala | Tyr | Ala | His | Arg | His | Leu | Ser | Ile | Thr | Gly | Ser | Gln | | |
| 770 | | | | | 775 | | | | | | 780 | | | | | | |
| Ile | Trp | Gln | Asn | Asp | Lys | Leu | Pro | Ser | Ala | Asn | Lys | Leu | Val | Ala | Asn | | |
| 785 | | | | | 790 | | | | | 795 | | | | | 800 | | |
| Gly | Val | Leu | Ala | Leu | Asn | Ala | Arg | Tyr | Ser | Gln | Ile | Ala | Asp | Asn | Thr | | |
| | | | 805 | | | | | | 810 | | | | | 815 | | | |
| Thr | Leu | Arg | Ala | Gly | Ala | Ile | Asn | Leu | Thr | Ala | Gly | Thr | Ala | Leu | Val | | |
| | | 820 | | | | | | 825 | | | | | 830 | | | | |
| Lys | Arg | Gly | Asn | Ile | Asn | Trp | Ser | Thr | Val | Ser | Thr | Lys | Thr | Leu | Glu | | |
| | | 835 | | | | 840 | | | | | | 845 | | | | | |
| Asp | Asn | Ala | Glu | Leu | Lys | Pro | Leu | Ala | Gly | Arg | Leu | Asn | Ile | Glu | Ala | | |
| 850 | | | | | 855 | | | | | | 860 | | | | | | |
| Gly | Ser | Gly | Thr | Leu | Thr | Ile | Glu | Pro | Ala | Asn | Arg | Ile | Ser | Ala | His | | |
| 865 | | | | 870 | | | | | | 875 | | | | | 880 | | |
| Thr | Asp | Leu | Ser | Ile | Lys | Thr | Gly | Gly | Lys | Leu | Leu | Leu | Ser | Ala | Lys | | |
| | | | 885 | | | | | 890 | | | | | | 895 | | | |
| Gly | Gly | Asn | Ala | Gly | Ala | Pro | Ser | Ala | Gln | Val | Ser | Ser | Leu | Glu | Ala | | |
| | | 900 | | | | | | 905 | | | | | 910 | | | | |
| Lys | Gly | Asn | Ile | Arg | Leu | Val | Thr | Gly | Glu | Thr | Asp | Leu | Arg | Gly | Ser | | |
| | | 915 | | | | | 920 | | | | | 925 | | | | | |
| Lys | Ile | Thr | Ala | Gly | Lys | Asn | Leu | Val | Val | Ala | Thr | Thr | Lys | Gly | Lys | | |
| 930 | | | | | 935 | | | | | | 940 | | | | | | |
| Leu | Asn | Ile | Glu | Ala | Val | Asn | Asn | Ser | Phe | Ser | Asn | Tyr | Phe | Pro | Thr | | |
| 945 | | | | 950 | | | | | | 955 | | | | | 960 | | |
| Gln | Lys | Ala | Ala | Glu | Leu | Asn | Gln | Lys | Ser | Lys | Glu | Leu | Glu | Gln | Gln | | |
| | | | 965 | | | | | | 970 | | | | | 975 | | | |
| Ile | Ala | Gln | Leu | Lys | Lys | Ser | Ser | Pro | Lys | Ser | Lys | Leu | Ile | Pro | Thr | | |
| | | 980 | | | | | | 985 | | | | | 990 | | | | |
| Leu | Gln | Glu | Glu | Arg | Asp | Arg | Leu | Ala | Phe | Tyr | Ile | Gln | Ala | Ile | Asn | | |
| | | 995 | | | | | 1000 | | | | | 1005 | | | | | |
| Lys | Glu | Val | Lys | Gly | Lys | Lys | Pro | Lys | Gly | Lys | Glu | Tyr | Leu | Gln | Ala | | |
| 1010 | | | | | 1015 | | | | | | 1020 | | | | | | |
| Lys | Leu | Ser | Ala | Gln | Asn | Ile | Asp | Leu | Ile | Ser | Ala | Gln | Gly | Ile | Glu | | |
| 1025 | | | | 1030 | | | | | | 1035 | | | | | 1040 | | |
| Ile | Ser | Gly | Ser | Asp | Ile | Thr | Ala | Ser | Lys | Lys | Leu | Asn | Leu | His | Ala | | |
| | | | 1045 | | | | | | 1050 | | | | | 1055 | | | |
| Ala | Gly | Val | Leu | Pro | Lys | Ala | Ala | Asp | Ser | Glu | Ala | Ala | Ala | Ile | Leu | | |
| | | 1060 | | | | | | 1065 | | | | | | 1070 | | | |
| Ile | Asp | Gly | Ile | Thr | Asp | Gln | Tyr | Glu | Ile | Gly | Lys | Pro | Thr | Tyr | Lys | | |
| | 1075 | | | | | 1080 | | | | | | 1085 | | | | | |
| Ser | His | Tyr | Asp | Lys | Ala | Ala | Leu | Asn | Lys | Pro | Ser | Arg | Leu | Thr | Gly | | |
| 1090 | | | | | 1095 | | | | | | 1100 | | | | | | |
| Arg | Thr | Gly | Val | Ser | Ile | His | Ala | Ala | Ala | Ala | Leu | Asp | Asp | Ala | Arg | | |
| 1105 | | | | 1110 | | | | | | 1115 | | | | | 1120 | | |
| Ile | Ile | Ile | Gly | Ala | Ser | Glu | Ile | Lys | Ala | Pro | Ser | Gly | Ser | Ile | Asp | | |
| | | | 1125 | | | | | 1130 | | | | | | 1135 | | | |
| Ile | Lys | Ala | His | Ser | Asp | Ile | Val | Leu | Glu | Ala | Gly | Gln | Asn | Asp | Ala | | |
| | | 1140 | | | | | | 1145 | | | | | 1150 | | | | |

Tyr Thr Phe Leu Lys Thr Lys Gly Lys Ser Gly Lys Ile Ile Arg Lys
 1155 1160 1165
 Thr Lys Phe Thr Ser Thr Arg Asp His Leu Ile Met Pro Ala Pro Val
 1170 1175 1180
 Glu Leu Thr Ala Asn Gly Ile Thr Leu Gln Ala Gly Gly Asn Ile Glu
 1185 1190 1195 1200
 Ala Asn Thr Thr Arg Phe Asn Ala Pro Ala Gly Lys Val Thr Leu Val
 1205 1210 1215
 Ala Gly Glu Glu Leu Gln Leu Leu Ala Glu Glu Gly Ile His Lys His
 1220 1225 1230
 Glu Leu Asp Val Gln Lys Ser Arg Arg Phe Ile Gly Ile Lys Val Gly
 1235 1240 1245
 Lys Ser Asn Tyr Ser Lys Asn Glu Leu Asn Glu Thr Lys Leu Pro Val
 1250 1255 1260
 Arg Val Val Ala Gln Thr Ala Ala Thr Arg Ser Gly Trp Asp Thr Val
 1265 1270 1275 1280
 Leu Glu Gly Thr Glu Phe Lys Thr Thr Leu Ala Gly Ala Asp Ile Gln
 1285 1290 1295
 Ala Gly Val Gly Glu Lys Ala Arg Val Asp Ala Lys Ile Ile Leu Lys
 1300 1305 1310
 Gly Ile Val Asn Arg Ile Gln Ser Glu Glu Lys Leu Glu Thr Asn Ser
 1315 1320 1325
 Thr Val Trp Gln Lys Gln Ala Gly Arg Gly Ser Thr Ile Glu Thr Leu
 1330 1335 1340
 Lys Leu Pro Ser Phe Glu Ser Pro Thr Pro Pro Lys Leu Ser Ala Pro
 1345 1350 1355 1360
 Gly Gly Tyr Ile Val Asp Ile Pro Lys Gly Asn Leu Lys Thr Glu Ile
 1365 1370 1375
 Glu Lys Leu Ser Lys Gln Pro Glu Tyr Ala Tyr Leu Lys Gln Leu Gln
 1380 1385 1390
 Val Ala Lys Asn Ile Asn Trp Asn Gln Val Gln Leu Ala Tyr Asp Arg
 1395 1400 1405
 Trp Asp Tyr Lys Gln Glu Gly Leu Thr Glu Ala Gly Ala Ala Ile Ile
 1410 1415 1420
 Ala Leu Ala Val Thr Val Val Thr Ser Gly Ala Gly Thr Gly Ala Val
 1425 1430 1435 1440
 Leu Gly Leu Asn Gly Ala Ala Ala Ala Thr Asp Ala Ala Phe Ala
 1445 1450 1455
 Ser Leu Ala Ser Gln Ala Ser Val Ser Phe Ile Asn Asn Lys Gly Asp
 1460 1465 1470
 Val Gly Lys Thr Leu Lys Glu Leu Gly Arg Ser Ser Thr Val Lys Asn
 1475 1480 1485
 Leu Val Val Ala Ala Ala Thr Ala Gly Val Ala Asp Lys Ile Gly Ala
 1490 1495 1500
 Ser Ala Leu Asn Asn Val Ser Asp Lys Gln Trp Ile Asn Asn Leu Thr
 1505 1510 1515 1520
 Val Asn Leu Ala Asn Ala Gly Ser Ala Ala Leu Ile Asn Thr Ala Ile
 1525 1530 1535
 Asn Gly Gly Ser Leu Lys Asp Asn Leu Gly Asp Ala Ala Leu Gly Ala
 1540 1545 1550
 Ile Val Ser Thr Val His Gly Glu Val Ala Ser Lys Ile Lys Phe Asn
 1555 1560 1565
 Leu Ser Glu Asp Tyr Ile Thr His Lys Ile Ala His Ala Ile Ala Gly
 1570 1575 1580
 Cys Ala Ala Ala Ala Ala Asn Lys Gly Lys Cys Gln Asp Gly Ala Ile
 1585 1590 1595 1600
 Gly Ala Ala Val Gly Glu Ile Val Gly Glu Ala Leu Thr Asn Gly Lys
 1605 1610 1615

Asn Pro Ala Thr Leu Thr Ala Lys Glu Arg Glu Gln Ile Leu Ala Tyr
 1620 1625 1630
 Ser Lys Leu Val Ala Gly Thr Val Ser Gly Val Val Gly Gly Asp Val
 1635 1640 1645
 Asn Thr Ala Ala Asn Ala Ala Lys Val Ala Ile Glu Asn Asn Leu Leu
 1650 1655 1660
 Ser Gln Glu Glu Tyr Ala Leu Arg Glu Lys Leu Ile Lys Lys Ala Lys
 1665 1670 1675 1680
 Gly Lys Gly Leu Leu Ser Leu Asp Trp Gly Ser Leu Thr Glu Gln Glu
 1685 1690 1695
 Ala Arg Gln Phe Ile Tyr Leu Ile Glu Lys Asp Arg Tyr Ser Asn Gln
 1700 1705 1710
 Leu Leu Asp Arg Tyr Gln Lys Asn Pro Ser Ser Leu Asn Asn Gln Glu
 1715 1720 1725
 Lys Asn Ile Leu Ala Tyr Phe Ile Asn Gln Thr Ser Gly Gly Asn Thr
 1730 1735 1740
 Ala Trp Ala Ala Ser Ile Leu Lys Thr Pro Gln Ser Met Gly Asn Leu
 1745 1750 1755 1760
 Thr Ile Pro Ser Lys Asp Ile Asn Asn Thr Leu Ser Lys Ala Tyr Gln
 1765 1770 1775
 Thr Leu Ser Arg Tyr Asp Ser Phe Asp Tyr Lys Ser Ala Val Ala Ala
 1780 1785 1790
 Gln Pro Ala Leu Tyr Leu Leu Asn Gly Pro Leu Gly Phe Ser Val Lys
 1795 1800 1805
 Ala Ala Thr Val Ala Ala Gly Gly Tyr Asn Ile Gly Gln Gly Ala Lys
 1810 1815 1820
 Ala Ile Ser Asn Gly Glu Tyr Leu His Gly Thr Val Gln Val Val Asn
 1825 1830 1835 1840
 Gly Thr Leu Met Val Ala Gly Ser Val Ser Ala Gln Ala Ala Ile Ser
 1845 1850 1855
 Ala Lys Pro Ala Pro Val Thr Arg Tyr Leu Ser Asn Asp Ser Ala Pro
 1860 1865 1870
 Ala Leu Arg Gln Ala Leu Thr Ala Glu Ser Gln Arg Ile Arg Met Lys
 1875 1880 1885
 Leu Pro Glu Glu Tyr Arg Gln Ile Gly Asn Leu Ala Ile Ala Lys Ile
 1890 1895 1900
 Asp Val Lys Gly Leu Pro Gln Arg Met Glu Ala Phe Ser Ser Phe Gln
 1905 1910 1915 1920
 Lys Gly Glu His Gly Phe Ile Ser Leu Pro Glu Thr Lys Ile Phe Lys
 1925 1930 1935
 Pro Ile Ser Val Asp Lys Tyr His Asn Ile Ala Ser Pro Pro Arg Gly
 1940 1945 1950
 Thr Leu Arg Asn Ile Asp Gly Glu Tyr Lys Leu Leu Glu Thr Ile Ala
 1955 1960 1965
 Gln Gln Leu Gly Asn Asn Arg Asn Val Ser Gly Arg Ile Asp Leu Phe
 1970 1975 1980
 Thr Glu Leu Lys Ala Cys Gln Ser Cys Ser Asn Val Ile Leu Glu Phe
 1985 1990 1995 2000
 Arg Asn Arg Tyr Pro Asn Ile Gln Leu Asn Ile Phe Thr Gly Lys
 2005 2010 2015

<210> 2

<211> 764

<212> PRT

<213> Neisseria gonorrhoeae

<400> 2

[illegible]

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 485 490 495
 Gly Asn Trp Tyr Phe Thr Pro Gln His Lys Leu Ser Leu Thr Ala Ser
 500 505 510
 His Gln Glu Arg Leu Pro Ser Thr Gln Glu Leu Tyr Ala His Gly Lys
 515 520 525
 His Val Ala Thr Asn Thr Phe Glu Val Gly Asn Lys His Leu Asn Lys
 530 535 540
 Glu Arg Ser Asn Asn Ile Glu Leu Ala Leu Gly Tyr Glu Gly Asp Arg
 545 550 555 560
 Trp Gln Tyr Asn Leu Ala Leu Tyr Arg Asn Arg Phe Gly Asn Tyr Ile
 565 570 575
 Tyr Ala Gln Thr Leu Asn Asp Gly Arg Gly Pro Lys Ser Ile Glu Asp
 580 585 590
 Asp Ser Glu Met Lys Leu Val Arg Tyr Asn Gln Ser Gly Ala Asp Phe
 595 600 605
 Tyr Gly Ala Glu Gly Glu Ile Tyr Phe Lys Pro Thr Pro Arg Tyr Arg
 610 615 620
 Ile Gly Val Ser Gly Asp Tyr Val Arg Gly Arg Leu Lys Asn Leu Pro
 625 630 635 640
 Ser Leu Pro Gly Arg Glu Asp Ala Tyr Gly Asn Arg Pro Leu Ile Ala
 645 650 655
 Gln Ala Asp Gln Asn Ala Pro Arg Val Pro Ala Ala Arg Leu Gly Val
 660 665 670
 His Leu Lys Ala Ser Leu Thr Asp Arg Ile Asp Ala Asn Leu Asp Tyr
 675 680 685
 Tyr Arg Val Phe Ala Gln Asn Lys Leu Ala Arg Tyr Glu Thr Arg Thr
 690 695 700
 Pro Gly His His Met Leu Asn Leu Gly Ala Asn Tyr Arg Arg Asn Thr
 705 710 715 720
 Arg Tyr Gly Glu Trp Asn Trp Tyr Val Lys Ala Asp Asn Leu Leu Asn
 725 730 735
 Gln Ser Val Tyr Ala His Ser Ser Phe Leu Ser Asp Thr Pro Gln Met
 740 745 750
 Gly Arg Ser Phe Thr Gly Gly Val Asn Val Lys Phe
 755 760

<210> 3

<211> 720

<212> PRT

<213> Neisseria gonorrhoeae

<400> 3

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 20 25 30
 Thr Val Thr Val Lys Gly Asp Arg Gln Gly Ser Lys Ile Arg Thr Asn
 35 40 45
 Ile Val Thr Leu Gln Gln Lys Asp Glu Ser Thr Ala Thr Asp Met Arg
 50 55 60
 Glu Leu Leu Lys Glu Glu Pro Ser Ile Asp Phe Gly Gly Gly Asn Gly
 65 70 75 80
 Thr Ser Gln Phe Leu Thr Leu Arg Gly Met Gly Gln Asn Ser Val Asp
 85 90 95

Tyr Ile Lys Asn His Gly Tyr Glu Leu Gly Ala Ser Tyr Arg Thr Gly
 565 570 575
 Gly Leu Thr Ala Lys Val Gly Val Ser His Ser Lys Pro Arg Phe Tyr
 580 585 590
 Asp Thr His Lys Asp Lys Leu Leu Ser Ala Asn Pro Glu Phe Gly Ala
 595 600 605
 Gln Val Gly Arg Thr Trp Thr Ala Ser Leu Ala Tyr Arg Phe Gln Asn
 610 615 620
 Pro Asn Leu Glu Ile Gly Trp Arg Gly Arg Tyr Val Gln Lys Ala Thr
 625 630 635 640
 Gly Ser Ile Leu Ala Ala Gly Gln Lys Asp Arg Lys Gly Asn Leu Glu
 645 650 655
 Asn Val Val Arg Lys Gly Phe Gly Val Asn Asp Val Phe Ala Asn Trp
 660 665 670
 Lys Pro Leu Gly Lys Asp Thr Leu Asn Val Asn Leu Ser Val Asn Asn
 675 680 685
 Val Phe Asn Lys Phe Tyr Tyr Pro His Ser Gln Arg Trp Thr Asn Thr
 690 695 700
 Leu Pro Gly Val Gly Arg Asp Val Arg Leu Gly Val Asn Tyr Lys Phe
 705 710 715 720

<210> 4

<211> 525

<212> PRT

<213> Neisseria gonorrhoeae

<400> 4

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 Leu Met Lys Thr Arg Ser Leu Ile Ser Leu Leu Cys Leu Leu Cys
 20 25 30
 Ser Cys Ser Ser Trp Leu Pro Pro Leu Glu Glu Arg Thr Glu Ser Arg
 35 40 45
 His Phe Asn Thr Ser Lys Pro Val Arg Leu Asp Asn Ile Leu Gln Ile
 50 55 60
 Arg His Thr Pro His Thr Asn Gly Leu Ser Asp Ile Tyr Leu Leu Asn
 65 70 75 80
 Asp Pro His Glu Ala Phe Ala Ala Arg Ala Ala Leu Ile Glu Ser Ala
 85 90 95
 Glu His Ser Leu Asp Leu Gln Tyr Tyr Ile Trp Arg Asn Asp Ile Ser
 100 105 110
 Gly Arg Leu Leu Phe Asn Leu Val Tyr Leu Ala Ala Glu Arg Gly Val
 115 120 125
 Arg Val Arg Leu Leu Leu Asp Asp Asn Asn Thr Arg Gly Leu Asp Asp
 130 135 140
 Leu Leu Leu Ala Leu Asp Ser His Pro Asn Ile Glu Val Arg Leu Phe
 145 150 155 160
 Asn Pro Phe Val Leu Arg Lys Trp Arg Ala Leu Gly Tyr Leu Thr Asp
 165 170 175
 Phe Pro Arg Leu Asn Arg Arg Met His Asn Lys Ser Phe Thr Ala Asp
 180 185 190
 Asn Arg Ala Thr Ile Leu Gly Gly Arg Asn Ile Gly Asp Glu Tyr Phe
 195 200 205
 Lys Val Gly Glu Asp Thr Val Phe Ala Asp Leu Asp Ile Leu Ala Thr
 210 215 220
 Gly Ser Val Val Gly Glu Val Ser His Asp Phe Asp Arg Tyr Trp Ala
 225 230 235 240

Ser His Ser Ala His Asn Ala Thr Arg Ile Ile Arg Ser Gly Asn Ile
 245 250 255
 Gly Lys Gly Leu Gln Ala Leu Gly Tyr Asn Asp Glu Thr Ser Arg His
 260 265 270
 Ala Leu Leu Arg Tyr Arg Glu Thr Val Glu Gln Ser Pro Leu Tyr Gln
 275 280 285
 Lys Ile Gln Thr Gly Arg Ile Asp Trp Gln Ser Val Gln Thr Arg Leu
 290 295 300
 Ile Ser Asp Asp Pro Ala Lys Gly Leu Asp Arg Asp Arg Arg Lys Pro
 305 310 315 320
 Pro Ile Ala Gly Arg Leu Gln Asp Ala Leu Lys Gln Pro Glu Lys Ser
 325 330 335
 Val Tyr Leu Val Ser Pro Tyr Phe Val Pro Thr Lys Ser Gly Thr Asp
 340 345 350
 Ala Leu Ala Lys Leu Val Gln Asp Gly Ile Asp Val Thr Val Leu Thr
 355 360 365
 Asn Ser Leu Gln Ala Thr Asp Val Ala Ala Val His Ser Gly Tyr Val
 370 375 380
 Lys Tyr Arg Lys Pro Leu Leu Lys Ala Gly Ile Lys Leu Tyr Glu Leu
 385 390 395 400
 Gln Pro Asn His Ala Val Pro Ala Thr Lys Asp Lys Gly Leu Thr Gly
 405 410 415
 Ser Ser Val Thr Ser Leu His Ala Lys Thr Phe Ile Val Asp Gly Lys
 420 425 430
 Arg Ile Phe Ile Gly Ser Phe Asn Leu Asp Pro Arg Ser Ala Arg Leu
 435 440 445
 Asn Thr Glu Met Gly Val Val Ile Glu Ser Pro Lys Ile Ala Glu Gln
 450 455 460
 Met Glu Arg Thr Leu Ala Asp Thr Ser Pro Glu Tyr Ala Tyr Arg Val
 465 470 475 480
 Thr Leu Asp Arg His Asn Arg Leu Gln Trp His Asp Pro Ala Thr Arg
 485 490 495
 Lys Thr Tyr Pro Asn Glu Pro Glu Ala Lys Leu Trp Lys Arg Ile Ala
 500 505 510
 Ala Lys Ile Leu Ser Leu Leu Pro Ile Glu Ser Leu Leu
 515 520 525

<210> 5

<211> 330

<212> PRT

<213> *Neisseria gonorrhoeae*

<400> 5

Met Gly Lys Gly Ile Leu Ser Leu Gln Gln Glu Met Ser Leu Glu Tyr
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 Ser Glu Lys Ser Tyr Gln Glu Val Leu Lys Ile Arg Gln Glu Ser Tyr
 20 25 30
 Trp Lys Arg Met Lys Ser Phe Ser Leu Phe Glu Val Ile Met His Trp
 35 40 45
 Thr Ala Ser Leu Asn Lys His Thr Cys Arg Ser Tyr Arg Gly Ser Phe
 50 55 60
 Leu Ser Leu Glu Lys Ile Gly Leu Leu Ser Leu Asp Met Asn Leu Gln
 65 70 75 80
 Glu Phe Ser Leu Leu Asn His Asn Leu Ile Leu Asp Ala Ile Lys Lys
 85 90 95
 Val Ser Ser Ala Lys Thr Ser Trp Thr Glu Gly Thr Lys Gln Val Arg
 100 105 110

Ala Ala Ser Tyr Ile Ser Leu Thr Arg Phe Leu Asn Arg Met Thr Gln
115 120 125
Gly Ile Val Ala Ile Ala Gln Pro Ser Lys Gln Glu Asn Ser Arg Thr
130 135 140
Phe Phe Lys Thr Arg Glu Ile Val Lys Thr Asp Ala Met Asn Ser Leu
145 150 155 160
Gln Thr Ala Ser Phe Leu Lys Glu Leu Lys Lys Ile Asn Ala Arg Asp
165 170 175
Trp Leu Ile Ala Gln Thr Met Leu Gln Gly Gly Lys Arg Ser Ser Glu
180 185 190
Val Leu Ser Leu Glu Ile Ser Gln Ile Cys Phe Gln Gln Ala Thr Ile
195 200 205
Ser Phe Ser Gln Leu Lys Asn Arg Gln Thr Glu Lys Arg Ile Ile Ile
210 215 220
Thr Tyr Pro Gln Lys Phe Met His Phe Leu Gln Glu Tyr Ile Gly Gln
225 230 235 240
Arg Arg Gly Phe Val Phe Val Thr Arg Ser Gly Lys Met Val Gly Leu
245 250 255
Arg Gln Ile Ala Arg Thr Phe Ser Gln Ala Gly Leu Gln Ala Ala Ile
260 265 270
Pro Phe Lys Ile Thr Pro His Val Leu Arg Ala Thr Ala Val Thr Glu
275 280 285
Tyr Lys Arg Leu Gly Cys Ser Asp Ser Asp Ile Met Lys Val Thr Gly
290 295 300
His Ala Thr Ala Lys Met Ile Phe Ala Tyr Asp Lys Ser Ser Arg Glu
305 310 315 320
Asp Asn Ala Ser Lys Lys Met Ala Leu Ile
325 330

<210> 6

<211> 6048

<212> DNA

<213> Neisseria gonorrhoeae

<400> 6

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| atgaataaag | gtttacatcg | cattatcttt | agtaaaaagc | acagcaccat | ggttgcagta | 60 |
| gccgaaactg | ccaacagcca | gggcaaaggt | aaacaggcag | gcagttcggt | ttctgtttca | 120 |
| ctgaaaactt | caggcgacct | ttgcggcaaa | ctcaaaaacca | cccttaaaac | cttgggtctgc | 180 |
| tctttggttt | ccctgagtat | ggtattgcct | gcccattgcc | aaattaccac | cgacaaatca | 240 |
| gcacctaaaa | accagcaggt | cgttatcctt | aaaaccaaca | ctgggtgccc | cttgggtgaat | 300 |
| atccaaactc | cgaatggacg | cggattgagc | cacaaccgct | atacgagtt | tgatgttgac | 360 |
| aacaaagggg | cagtgttaaa | caacgaccgt | aacaataatc | cgtttctggt | caaaggcagt | 420 |
| gcgcaattga | ttttgaacga | ggtacgcggt | acggctagca | aactcaacgg | catcgttacc | 480 |
| gtaggcggtc | aaaaggccga | cgtgattatt | gccaacccca | acggcattac | cgттаатggc | 540 |
| ggcggcttta | aaaatgtcgg | tcggggcatc | ttaactatcg | gtgcgcccc | aatcggcaaa | 600 |
| gacgggtcac | tgacaggatt | tgatgtgcgt | caaggcacat | tgaccgtagg | agcagcaggt | 660 |
| tggaatgata | aaggcggagc | cgactacacc | ggggactctg | ctcgtgcagt | tgctttgcag | 720 |
| gggaaattac | agggtaaaaa | cctggcggtt | tctaccggtc | ctcagaaaag | agattacgcc | 780 |
| agcggcgaaa | tcagtgcagg | tacggcagcg | ggtacgaaac | cgactattgc | ccttgatact | 840 |
| gccgcactgg | gcggtatgta | cgccgacagc | atcacactga | ttgccaatga | aaaaggcgta | 900 |
| ggcgtcaaaa | atgccggcac | actcgaagcg | gccaagcaat | tgattgtgac | ttcgtcaggc | 960 |
| cgcattgaaa | acagcggccg | catcgccacc | actgccgacg | gcaccgaagc | ttcaccgact | 1020 |
| tatctctcca | tcgaaaccac | cgaaaaagga | gcggcaggca | catttatctc | caatgggtgt | 1080 |
| cggatcgaga | gcaaaggctt | attggttatt | gagacgggag | aagatatcag | cttgcgtaac | 1140 |
| ggagccgtgg | tcgagaataa | cggcagtcgc | ccagctacca | cggtattaaa | tgctgggtcat | 1200 |
| aatttggtga | ttgagagtaa | aactaatgtg | aacaatgcca | aaggctcggc | taatctgtcg | 1260 |
| gccggcggtc | gtactacgat | caatgatgct | actattcaag | cgggcagttc | cgtgtacagc | 1320 |
| tccaccaaag | gcgatactga | attgggtgaa | aatacccgtg | ttattgctga | aaacgtaacc | 1380 |

| | | | | | | |
|------------|------------|------------|-------------|-------------|------------|------|
| ttgacagcta | aagaacgcga | acagattttg | gcatacagca | aactggttgc | cggtacggta | 4920 |
| agcgggtgtg | tgcggcgga | tgtgaataca | gcggcgaatg | cggtctaaagt | cgcgattgaa | 4980 |
| aataacctat | tatctcaaga | agagtatgct | cttagagaaa | aattgatcaa | aaaagccaaa | 5040 |
| gggaaaggcc | tattatcttt | agattggggc | agcctgaccg | aacaagaggc | aaggcagttt | 5100 |
| atctatttga | ttgagaaaga | tcgatattct | aatcaattgc | ttgaccgata | tcaaaaaaat | 5160 |
| ccaagtagtt | taaataatca | agaaaaaaat | attcttgcac | attttattaa | ccaaacctct | 5220 |
| ggaggtaaca | cagcttgggc | agcttcgata | ctgaaaacgc | cccagtcaat | gggtaatctc | 5280 |
| actattcctt | ccaaagatat | taataacacc | ttatcgaaag | cctatcaaac | attgagtcgt | 5340 |
| tatgattctt | ttgattacaa | atcagctggt | gccgcacaac | ctgcacttta | cttattaaac | 5400 |
| ggaccgcttg | gcttcagtg | caaagcagct | actgtggcag | caggaggata | taacattgga | 5460 |
| cagggagcga | aagcaatctc | taatggagaa | tatctgcacg | gtacagttca | ggttgttaat | 5520 |
| ggcacattga | tggttgcagg | atctgtatct | gcacaggctg | caatatcggc | caagcctgca | 5580 |
| cctgttacct | gttatctgag | caatgacagt | gctcctgctt | taagacaagc | tttaactgct | 5640 |
| gaaagccaga | gaatccgcac | gaaactgccg | gaagagtatc | gacaaatagg | gaatcttgcg | 5700 |
| atagcaaaaa | ttgatgttaa | aggattaccg | caaaggatgg | aagcatttag | ttctttccaa | 5760 |
| aaaggggaac | atggatttat | ttcggtacct | gaaacaaaaa | tttttaaacc | tatatctggt | 5820 |
| gataaatatc | ataatattgc | ctctcctcct | agaggaacat | taagaaatat | agatggagaa | 5880 |
| tataaattac | ttgaaactat | agcacagcaa | ctcggaataa | atcgtaatgt | atcaggtaga | 5940 |
| attgatctat | ttacagaatt | aaaggcctgt | caatcttgca | gcaatgttat | tttagagttt | 6000 |
| agaaatcgct | atccaaatat | tcaattaaat | attttttacag | gaaaaatag | | 6048 |

<210> 7

<211> 2295

<212> DNA

<213> Neisseria gonorrhoeae

<400> 7

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| atgcgacgag | aagccaaaat | ggcacaaaat | acactcaaac | ccattgtttt | atcaattctt | 60 |
| ttaatcaaca | cacccctcct | ctcccaagcg | catggaactg | agcaatcagt | gggcttggaa | 120 |
| acggtcagcg | tcgtcggcaa | aagccgtccg | cgcgccactt | cggggctgct | gcacacttct | 180 |
| accgcctccg | acaaaatcat | cagcggcgac | accttgcgac | aaaaagccgt | caacttgggt | 240 |
| gatgctttag | acggcgtacc | gggcattcat | gcctcgcaat | acggcggcgg | cgcacccgct | 300 |
| cccgttatcc | gcgggtcaaac | aggcagacgg | attaaagtgt | tgaaccatca | cggcgaaacg | 360 |
| ggcgacatgg | cggactttct | tccagaccat | gcaatctaga | tggacagcgc | cttgtcgcaa | 420 |
| caggctgaaa | tcctgcgcgg | tccggttacg | ctcttgtaca | gctcgggcaa | tgtggcgggg | 480 |
| ctggctgatg | ttgccgatgg | caaaaatccc | gaaaaaatgc | ctgaaaacgg | cgtatcgggc | 540 |
| gaactcggat | tgcgttttag | cagcggcaat | ctggaaaaac | tcacgtccgg | cggcatcaat | 600 |
| atcggtttgg | gcaaaaactt | tgtattgcac | acggaagggc | tgtaccgcaa | atcgggggat | 660 |
| tacgccgtac | cgcgttaccg | caatctgaaa | cgcctgcccg | acagccacgc | cgtatcgcaa | 720 |
| acgggcagca | tcgggctgtc | ttgggttggc | gaaaaaggct | ttatcggcgc | agcatacagc | 780 |
| gaccgtcgcg | accaatatgg | tctgcctgcc | cacagccacg | aatacgtatg | ttgccacgcc | 840 |
| gacatcatct | ggcaaaagag | tttgattaac | aaacgctatt | tgcagcttta | tccgcacctg | 900 |
| ttgaccgaag | aagacatcga | ttacgacaat | ccgggcttga | gctgcggctt | tcacgacgac | 960 |
| gatgatgcac | acgcccattg | ccacaacggc | aaaccttggg | tagacctgcg | caacaaacgc | 1020 |
| tacgaactcc | gcgccgaatg | gaagcaacgg | ttccccgggt | ttgaagccct | gcgcgtacac | 1080 |
| ctgaaccgca | acgactaccg | ccacgacgaa | aaagcaggcg | atgcagtaga | aaactttttt | 1140 |
| aacaaccaa | cgcaaaacgc | ccgtatcgag | ttgcgccacc | aacctatagg | ccgtctgaaa | 1200 |
| ggcagctggg | gcgtgcaata | tttgggacaa | aaatccagtg | ctttatctgc | cacatccgaa | 1260 |
| gcgggtcaaac | aaccgatgtc | gcttgacaat | aaagtgaac | attacagctt | tttcgggtga | 1320 |
| gaacaggcaa | actgggacaa | cttcacgctt | gaaggcggcg | tacgcgtgga | aaaacaaaaa | 1380 |
| gcctccatcc | gctacgacaa | agcattgatt | gatcgggaaa | actactacaa | ccatccccctg | 1440 |
| cccgcctcgc | gcgcgcaccg | ccaaaccgcc | cgtccattcg | cactttcggg | caactgggat | 1500 |
| ttcacgccac | aacacaaaact | cagcctgacc | gcctcccatc | aggaacgcct | gccgtcaacg | 1560 |
| caagagctgt | acgcacacgg | caaacacgtc | gccaccaaca | cctttgaagt | cggcaacaaa | 1620 |
| cacctcaaca | aagagcgctt | caacaatatc | gaactcgcgc | tgggctacga | aggcgaccgc | 1680 |
| tggcaatata | atctggcact | ctaccgcaac | cgtctcggca | actacattta | cgcccaaacc | 1740 |
| ttaaaccgacg | gacgcggccc | caaattccatc | gaagacgaca | gcgaaatgaa | gctcgtgcgc | 1800 |

| | | | | | | |
|-------------|-------------|-------------|------------|------------|-------------|------|
| tacaaccaat | ccggtgcgga | cttctacggc | gcggaaggcg | aaatctactt | caaaccgaca | 1860 |
| ccgcgctacc | gcacgcgggt | ttccggcgac | tatgtacgag | gccgtctgaa | aaacctgcct | 1920 |
| tccttaccgg | gcagggaaga | cgctacggc | aaccgcccac | tcattgccc | agccgaccaa | 1980 |
| aacgcccctc | gcgttcggc | tgcgcgctc | ggcgtccacc | tgaaagcctc | gctgaccgac | 2040 |
| cgcatcgatg | ccaatttgga | ctactaccgc | gtgttcgccc | aaaacaaact | cgcccgctac | 2100 |
| gaaacgcgca | cgcccgacga | ccatattgctc | aacctcggcg | caaactaccg | ccgcaatacg | 2160 |
| cgctatggcg | agtgggaattg | gtacgtcaaa | gccgacaacc | tgctcaacca | atccggtttac | 2220 |
| gccacacagca | gcttcctctc | tgatacgccg | caaattgggc | gcagctttac | cggcggcggtg | 2280 |
| aacgtgaagt | tttaa | | | | | 2295 |

<210> 8

<211> 2307

<212> DNA

<213> *Neisseria gonorrhoeae*

<400> 8

| | | | | | | |
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| tgtaatatata | aataaaaaata | attattaatt | atTTTTctta | tcctgccaaa | tcttaacggt | 60 |
| ttggattttac | ttcccttcat | actcaagagg | acgattgaat | gaatacccca | ttgttccgctc | 120 |
| tcagcctgct | ctcgcctaca | cttgccggcag | gttttgccca | cgcggcagaa | aataatgcc | 180 |
| aggctgtaact | ggataccggt | actgtaaaag | gcgacgccca | aggcagcaaa | atccgtacca | 240 |
| acatcggttac | gctgcaacaa | aaagacgaaa | gcaccgcaac | cgatatgcgc | gaactcttaa | 300 |
| aagaagagcc | gtccatcgat | ttcggcgggc | gcaacggcac | gtcccaattc | ctgacgctgc | 360 |
| gcggcatggg | tcagaactct | gtcgacatca | aggtggacaa | cgcttattcc | gacagccaaa | 420 |
| tcctttacca | ccaaggcaga | tttattgtcg | atcccgcttt | ggttaaagtc | gtttccgtac | 480 |
| aaaaaggcgc | gggttcgcgc | tctgccggta | tcggcgcgac | caacggcgcg | atcatcgcca | 540 |
| aaaccgctga | tgcccaagac | ctgctcaaag | gcttgataa | aaactggggc | gtgcgcctca | 600 |
| acagcggctt | tgccagcaac | gaaggcgtaa | gctacggcgc | aagcgtattc | ggaaaagagg | 660 |
| gcaacttcga | cggttggttc | tcttacaacc | gcaacgatga | aaaagattac | gaagccggca | 720 |
| aagggtttccg | caatgtcaac | ggcggcaaaa | ccgtaccgta | cagcgcgctg | gacaaacgca | 780 |
| gctacctcgc | caaaatcgga | acaaccttcg | gcgacgacga | ccaccgcatc | gtgttgagcc | 840 |
| acatgaaaga | ccaacaccgg | ggcatccgca | ctgtgcgtga | agaattttacc | gtcggcgaca | 900 |
| aaagttcacg | gataaatatt | gaccgccaag | cccctgctta | ccgcgaaaact | acccaatcca | 960 |
| acaccaactt | ggcgtacacg | ggtaaaaacc | tgggctttgt | cgaaaaactg | gatgccaaacg | 1020 |
| cctatgtgtt | ggaaaaagaa | cgctattccg | ccgatgacag | cggcaccggc | tacgcaggca | 1080 |
| atgtaaaagg | ccccaaccat | accggaatca | ccactcgtgg | tgcgaaacttc | aacttcgaca | 1140 |
| gccgccttgc | cgaacaaaacc | ctgttgaaat | ccatcccgc | gacagaagag | aaaaacggtc | 1200 |
| aaccgcaagc | atTTTTgaac | tcgaaattct | ccatcccgc | gacagaagag | aaaaacggtc | 1260 |
| aaaaagtcga | taaaccgatg | gaacaacaaa | tgaaagaccg | tgcatgatga | gacactgttc | 1320 |
| acgcctacaa | actttccaac | ccgacccaaa | ccgataccgg | cgtatatgtt | gaagccattc | 1380 |
| acgacatcgg | cgatttcacg | ctgaccggcg | ggctgcgtta | cgaccgcttc | aagggtgaaaa | 1440 |
| cccatgacgg | caaaaccggt | tcaagcagca | accttaacct | gagtttcggg | gtgatttggc | 1500 |
| agccgcacga | acactggagc | ttcagcgcg | gccacaacta | cgccagccgc | agcccgcgcc | 1560 |
| tgtatgacgc | gctgcaaacc | cacggtaaac | gcggcatcat | ctcgattgcc | gacggcacaa | 1620 |
| aagccgaacg | cgcgcgcaat | accgaaatcg | gcttcaacta | caacgacggc | acgtttgccg | 1680 |
| caaacggcag | ctacttctgg | cagaccatca | aagacgcgct | tgccaatccg | caaaaccgcc | 1740 |
| acgactctgt | cgccgtccgt | gaagccgtca | atgccgggta | catcaaaaac | cacgggttacg | 1800 |
| aattggggcg | gtcctaccgc | accggcgggc | tgactgccaa | agtcggcgctc | agccacagca | 1860 |
| aaccgcgctt | ttacgatacg | cacaaagaca | agctgttgag | cgcgaatcct | gaatttggcg | 1920 |
| cacaagtcgg | ccgcacttgg | acggcctccc | ttgcctaccg | cttccaaaat | ccgaatctgg | 1980 |
| aaatcggctg | gcgcggccgt | tatgttcaaa | aagctacggg | ttcgatattg | gcggcagggtc | 2040 |
| aaaaagaccg | caaaggcaac | ttggaaaaacg | ttgtacgcaa | aggtttcggg | gtgaacgatg | 2100 |
| tcttcgccaa | ctggaaaaccg | ctgggcaaacg | acacgctcaa | tgtcaatctt | tcggttaaca | 2160 |
| acgtgttcaa | caagttctac | tatccgcaca | gccaacgctg | gaccaatacc | ctgccggggcg | 2220 |
| tgggacgtga | tgtacgcttg | ggcgtgaact | acaagttcta | aaacgcacat | cccgaaaaaa | 2280 |
| tgccgtctga | aagcctttca | gacggca | | | | 2307 |

<210> 9
 <211> 1578
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 9
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 ctggaagaac ggacggaaaag ccgtcatttc aatacttcca aaccgcgccg cctggacaac 180
 atcctgcaaa tccggcacac ccctcatacc aacgggctat ccgatatcta tctgttgaac 240
 gacccccacg aagccttttg cgcccgcgcc gcccttatcg aatctgccga acacagcctc 300
 gatttgcaat actacatctg gcgcaacgac atttcgggcc gactgctgtt caacctcgtg 360
 taccttgccg cagaacgcgg tgtgcgcgta cgcctgctgt tggacgacaa caacacgcgc 420
 ggattggacg acctcctgct cgccctcgac agccatccca atatcgaagt gcgcctgttc 480
 aacccttctg tcttacgaaa atggcgcgca ctcggctacc tgaccgactt ccccgccctc 540
 aaccgcccga tgcacaacaa atcctttacc gccgacaacc gcgccaccat actcggcgga 600
 cgcaatatcg gcgacgaata cttcaaaagtc ggtgaggaca ccgttttcgc cgacctggac 660
 atcctcgcca ccggcagcgt cgtcggcgaa gtatcgacg acttcgaccg ctactgggca 720
 agccattccg ccacacaacgc cacgcgcac atccgcagcg gcaacatcgg caagggtcct 780
 caagcactcg gatacaacga cgaaacgtcc agacacgcgc tcctgcgcta ccgcgaaacc 840
 gtcgaacagt cgccctctta ccaaaaaata cagacaggac gcatcgactg gcagagcgtc 900
 caaacccgcc tcatcagcga cgacctgca aaaggactcg accgcgaccg ccgcaaacccg 960
 ccgattgccc ggcggtgca agacgcgctc aaacagcccg aaaaaagcgt ctatctggtt 1020
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 caaccacaac atgccgtccc tgccacaaaa gacaaaggcc tgaccggcag ctccgtaacc 1260
 agcctgcatg ccaaaacctt cattgtggac ggcaaacgca tcttcacggt ctcattcaac 1320
 ctcgaccccc gttccgcacg gctcaatact gaaatgggcg ttgttatcga aagccccaaa 1380
 atcgcagaac agatggagcg cacccttgcc gatacctcac ccgaatacgc ctaccgcgtt 1440
 accctcgaca ggcacaaccc cctgcaatgg cacgatcccg ccacccgaaa aacctaccgc 1500
 aacgaaccgc aagccaaact ttggaacgc atcgccgcaa aaatcctatc cctgctgccc 1560
 atagaaagtt tattatag 1578

<210> 10
 <211> 993
 <212> DNA
 <213> Neisseria gonorrhoeae

<400> 10
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 tatcaggaag ttttaaaaat tgcgcaagaa tcctattgga aacgcatgaa aagcttctcc 120
 ttattcgaag ttattatgca ttggaccgca tcaactcaaca aacatacttg tagatcatat 180
 cgaggatctt ttttgtcttt agaaaagatt ggtctattgt ccttgatat gaatctgcaa 240
 gagttttccc ttttaaatca taatctaata ctagatgcga ttaaaaaagt ttcctctgcc 300
 aagacttctt ggaccgaagg tactaaacaa gttcgagcag caagctatat ttccttaaca 360
 agattcctaa acaggatgac tcaaggaata gtcgctatag cgcaaccttc taaacaagaa 420
 aatagtcgaa cattttttaa aaccagggaa atagtaaaaa cggatgcgat gaacagtttg 480
 caaacagcat ccttcctaaa agagctaaaa aaaatcaatg cccgggattg gttgatcgcc 540
 cagacaatgc tccaaggagg taaacgctcc tctgaagtct taagcttgga gattagtcag 600
 atttgtttcc aacaagctac catttctttc tccagctta agaaccgtca gacagaaaag 660
 aggattatta taacttatcc tcagaagttt atgcacttcc tacaagagta catcggtcaa 720
 cgaagaggtt ttgtcttcgt aactcgctcc ggaaaaatgg tgggggttaag gcaaatcgcc 780
 cgcacgttct ctcaagcagg actacaagct gcaatccctt ttaaaataac ccgcacgtg 840
 cttcgagcaa ccgctgtgac ggagtacaaa cgcttagggg gctcagactc cgacataatg 900
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 gacaacgctt caaagaagat ggctctaata tag 993

<210> 11
 <211> 199
 <212> PRT
 <213> Mus musculus

<400> 11
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 Val Met Glu Gln Phe Lys Lys Ser Lys Thr Leu Phe Ser Leu Met Gln
 35 40 45
 Tyr Ser Asp Glu Phe Arg Ile His Phe Thr Phe Asn Asp Phe Lys Arg
 50 55 60
 Asn Pro Ser Pro Arg Ser His Val Ser Pro Ile Lys Gln Leu Asn Gly
 65 70 75 80
 Arg Thr Lys Thr Ala Ser Gly Ile Arg Lys Val Val Arg Glu Leu Phe
 85 90 95
 His Lys Thr Asn Gly Ala Arg Glu Asn Ala Ala Lys Ile Leu Val Val
 100 105 110
 Ile Thr Asp Gly Glu Lys Phe Gly Asp Pro Leu Asp Tyr Lys Asp Val
 115 120 125
 Ile Pro Glu Ala Asp Arg Ala Gly Val Ile Arg Tyr Val Ile Gly Val
 130 135 140
 Gly Asn Ala Phe Asn Lys Pro Gln Ser Arg Arg Glu Leu Asp Thr Ile
 145 150 155 160
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